

# APPENDIX E

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MEMORANDUM FROM MR. VINCENT AVERNA, SPECIAL  
INVESTIGATION UNIT ON GULF WAR ILLNESSES, TO LIEUTENANT  
COLONEL A. J. KUEHN, U.S. ARMY

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MEMORANDUM FOR MR. VINCENT AVERNA  
Committee on Veterans' Affairs, US Senate

SUBJECT: Additional Khamisiyah Calculations

During the Khamisiyah brief to the Senate Veterans' Affairs Committee at DSWA Headquarters, the following question was asked:

"How much dose would an individual have received had he entered the pit area 24 hours after the detonation and remained at one of the stack positions for 15 minutes?"

Analysis reveals that the total dose to an individual given the above scenario would be something like  $4.3 \times 10^{-3}$  mg-min/m<sup>3</sup>, far below any dose which would have resulted in observable symptoms. To reach the general population limit, he would have had to spend over 45 minutes at the pit, and to reach the miosis level he would have had to spend almost 60 continuous hours there, and that in itself assumes a constant evaporative rate, which it wasn't.

The above-mentioned doses are inhalation only. No attempt has been made to model the potential contact hazard and percutaneous dose.



A. J. Kuehn  
Lieutenant Colonel  
U. S. Army